

Remarks

In view of the above amendments and the following remarks, reconsideration and further examination are requested.

The specification has been objected to as containing two typographical errors. The specification has been amended so as to correct these typographical errors. No new matter has been added by these amendments. As a result, withdrawal of the objection is respectfully requested.

Claim 1 has been amended so as to include the features of claim 6 and claims 6, 10, 13, 15 and 16 have been canceled without prejudice or disclaimer to the subject matter contained therein. Further, claim 19 has been amended so as to make a minor editorial revision.

Claims 17-21 have been rejected under 35 U.S.C. §102(e) as being anticipated by Ziemins (US 6,622,334). Claims 1-3 and 7 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Moinpour (US 6,334,229) in view of Jones (US 6,427,566). Claims 1-3 and 7 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Krusell (US 6,594,847) in view of Jones. Claims 4, 5, 8, 9, 11, 12 and 14 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Moinpour in view of Jones and further in view of Ziemins. Claims 4, 5, 8, 9, 11, 12 and 14 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Krusell in view of Jones and further in view of Ziemins. Claims 6, 10, 13, 15 and 16 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Moinpour in view of Jones and Ziemins and further in view of Bliven (US 6,439,245). Claims 6, 10, 13, 15 and 16 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Krusell in view of Jones and Ziemins and further in view of Bliven. Claims 1-4, 6-8, 10, 12, 13, 15, 16, 17-19 and 21 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Yashiki (US 6,041, 465) in view of Gockel (US 6,119,295).

The above-mentioned rejections are respectfully traversed and submitted to be inapplicable to the claims for the following reasons.

Claim 1 is patentable over the combinations of (1) Moinpour, Jones, Ziemins and Bliven, (2) Krusell, Jones, Ziemins and Bliven, and (3) Yashiki and Gockel, since claim 1 recites a substrate cleaning apparatus having, in part, a contact location adjusting

mechanism for vertically adjusting a contact location of a cleaning member with the substrate in a height direction of a cleaning member. None of the combinations discloses or suggests a contact location adjusting mechanism as recited in claim 1.

In the first two combinations of references, Bliven is relied upon as disclosing the contact location adjusting mechanism. In this regard, Bliven discloses a wafer processing station 20 including wafer rotation rollers 202a and 202b which are mounted on shafts 204a and 204b, respectively, and height adjustment knobs 208a and 208b for adjusting the height of the wafer rotation rollers 202a and 202b, respectively. (See column 4, lines 33-51 and Figure 3A). However, the wafer rotation rollers 202a and 202b are not disclosed as having a cleaning member as suggested in rejection. Instead, the wafer rotation rollers 202a and 202b are only disclosed as functioning to rotate a wafer. Therefore, it would not have been obvious to combine the height adjustment knobs 208a and 208b of Bliven, which are not associated with a cleaning member, with the inventions of Moinpour and Krusell as suggested in the rejections. As a result, the combination of the Moinpour, Jones, Ziemins and Bliven and the combination of Krusell, Jones, Ziemins and Bliven fail to disclose or suggest the present invention as recited in claim 1.

In the third combination, Yashiki discloses a cleaning apparatus have three chuck member 1-1 to 1-3 that are used to rotate a wafer W while top and bottom surfaces of the wafer W are cleaned by a pair of rod-shaped brushes 3-1 and 3-2. Each of the chuck members 1-1 to 1-3 is constructed with a roller 12 affixed to a steel shaft 11 with a gear 13 affixed to a lower end of the shaft 11. The rollers 12 each have a number of grooves 14 into which the wafer W is fitted such that the wafer W can be securely held. (See column 5, lines 11-53 and Figures 1-3). However, even though there are a number of grooves 14 into which the wafer W can be fitted. There is no disclosure or suggestion in Yashiki of a mechanism for vertically adjusting the contact location of the rollers 12 with the wafer W as recited in claim 1. Further, it is noted that although Gockel is indicated as being combined with Yashiki in this rejection, there is no indication of what elements and/or how Gockel is being relied upon. As a result, claim 1 is patentable over the combination of Yashiki and Gockel.

Claim 17 is patentable over Ziemins and the combination of Yashiki and Gockel, since claim 17 recites a substrate cleaning apparatus including, in part, a pair of bases movable to come close to or to go away from each other, and a cleaning nozzle for directing a cleaning liquid between the scrub-cleaning member and the periphery of the substrate. Neither Ziemins nor the combination of Yashiki and Gockel discloses or suggests these features as recited in claim 17.

Ziemins discloses a CMP apparatus 10 that includes a cleaning apparatus 16 having upper and lower brushes 18, 20 for clean the upper and lower surfaces of a wafer W, respectively, and a pair of control arms 22 each having a drive wheel 24 for rotating the wafer W, a motor 26 for driving the drive wheel 24, and a guide wheel 28 with a polishing pad 34 located thereon for cleaning the end face of the wafer W. Ziemins also discloses an alternative embodiment in which the polishing pads 34 are provided on the drive wheels 24 and the guide wheels 28 are eliminated. (See column 2, line 63 – column 3, line 44 and Figure 2).

The rejection indicates that Ziemins discloses a pair of bases as recited in claim 17. However, the control arms 22 are not disclosed as being movable to come close to or to go away from each other. Further, although Ziemins generally indicates that a water jet can also be used with the cleaning apparatus 16 at column 4, lines 64-67, Ziemins does not disclose or suggest that the water jet would be for directing a cleaning liquid between the polishing pads 34 and the periphery of the wafer W. As a result, Ziemins fails to disclose or suggest the present invention as recited in claim 17.

As for the combination of Yashiki and Gockel, Yashiki discloses a cleaning apparatus have three chuck members 1-1 to 1-3 that are used to rotate a wafer W while top and bottom surfaces of the wafer W are cleaned by a pair of rod-shaped brushes 3-1 and 3-2. Each of the chuck members 1-1 to 1-3 is constructed with a roller 12 affixed to a steel shaft 11 with a gear 13 affixed to a lower end of the shaft 11. The rollers 12 each have a number of grooves 14 into which the wafer W is fitted such that the wafer W can be securely held. A motor causes one or more of the chuck member 1-1 to 1-3 to rotate, thus rotating the wafer W during cleaning by the rod-shaped brushes 3-1 to 3-2. Further, the cleaning apparatus has a pair of nozzles 5-1 and 5-2 positioned so as to supply water

to the upper and lower surfaces of the wafer W. (See column 5, lines 11-53; column 7, lines 47-50; and Figures 1-3).

Although Yashiki discloses the three chuck members 1-1 to 1-3, Yashiki does not disclose or suggest a pair of bases that are movable to come close to or to go away from each other. Further, The nozzles 5-1 and 5-2 are disclosed as supplying water to the top and bottom surfaces of the wafer W and do not direct a cleaning liquid between the chuck members 1-1 to 1-3 and the wafer W. In addition, it is again noted that although Gockel is indicated as being combined with Yashiki in this rejection, there is no indication of what elements and/or how Gockel is being relied upon. As a result, claim 17 is patentable over the combination of Yashiki and Gockel.

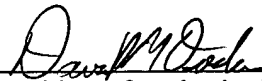
Because of the above mentioned distinctions, it is believed clear that claims 1-5, 7-9, 11, 12, 14, and 17-21 are allowable over the references relied upon in the rejections. Furthermore, it is submitted that the distinctions are such that a person having ordinary skill in the art at the time of invention would not have been motivated to make any combination of the references of record in such a manner as to result in, or otherwise render obvious, the present invention as recited in claims 1-5, 7-9, 11, 12, 14, and 17-21. Therefore, it is submitted that claims 1-5, 7-9, 11, 12, 14, and 17-21 are clearly allowable over the prior art of record.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance. The Examiner is invited to contact the undersigned by telephone if it is felt that there are issues remaining which must be resolved before allowance of the application.

Respectfully submitted,

Hiroshi SOTOZAKI et al.

By:


David M. Ovedovitz
Registration No. 45,336
Attorney for Applicant

DMO/jmj
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
September 10, 2004